Composition of polyphenols in fresh tea leaves and associations of their oxygen-radical-absorbing capacity with antiproliferative actions in fibroblast cells.

梁有志
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Abstract

The polyphenols in various parts of the tea plant used in manufacture of tea products (young leaves, old leaves, and stem) were analyzed by HPLC. The young leaves (apical bud and the two youngest leaves) were found to be richer (2.7-fold) in polyphenols than old leaves (from the tenth to the fifth leaf). Also, the tea polyphenols were found to be higher (1.4-fold) in summer than in spring. Ten different types of commercial tea (manufactured tea), including unfermented, semifermented, and fermented tea, were analyzed for their polyphenol compounds, and it was found that both yields of solids in tea water extracts (TWEs) and the amount of (-)-epigallocatechin 3-gallate (EGCG) in these products varied with different tea leaves and processing methods. Longjing tea (unfermented green tea) contained the highest concentration of EGCG and polyphenols, whereas Assam black tea (most fermented) contained the least. Longjing TWEs showed strong inhibitory effect on DNA synthesis in A-431 tumor cells. We also found that green tea polyphenols (GTPs) and EGCG strongly inhibited tumor cell DNA synthesis and peroxyl-radical generation. The evidence suggests that the strong antioxidative and antiproliferative activities of Longjing TWEs and GTPs are mainly due to the higher contents of tea polyphenols. EGCG (the major component of GTPs) showed strong inhibitory action on the growth of immortalized cells (NIH3T3) and tumor cells (S-180II) but almost no effect on the growth of normal cells (C3H10T1/2).